

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

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REPLY TO: 5330 (6500) Functional Trespass

October 12, 1970

SUBJECT: Investigation of California Black Oak Failure on
Mountain Empire Power Company R.O.W., Troy Canyon,
Descanso District, Cleveland National Forest.



TO: Russell J. Mays, Attorney, Office of The General Counsel

At your special request, in anticipation of possible civil litigation involving the United States, on Saturday, October 3, 1970, I examined a California Black Oak in Troy Canyon, Cleveland National Forest. This is the tree that apparently failed and broke the power line which started the Laguna Mountain Fire on the morning of September 26, 1970. I was accompanied to the site by George O. Witbeck, Chief Criminal Investigator (R-5); William A. Derr, Southern Zone (R-5) Investigator; William Dixon, Daniel Boone National Forest (R-8), and Robert M. Carey, Jefferson National Forest (R-8).

General

The tree which was only partially consumed by the fire exhibits a very high proportion of defect both in the standing bole (Photo Nos. 4 through 13) and portions of the bole which fell to the ground (Photo Nos. 14 through 19). The decayed inside portion of the bole appears to be about all that really burned. For the most part, very little of the sound main bole material was consumed by the fire.

The diameter of the tree below the main fork at 3 feet, 6 inches above the ground was about 40 inches. The tree was forked at about 63 inches above the average ground line. The diameter of the bole leaning towards the power line was about 24 inches (measured just above the fork). The diameter of the main bole was about 33 inches just above the fork (Photo No. 12).

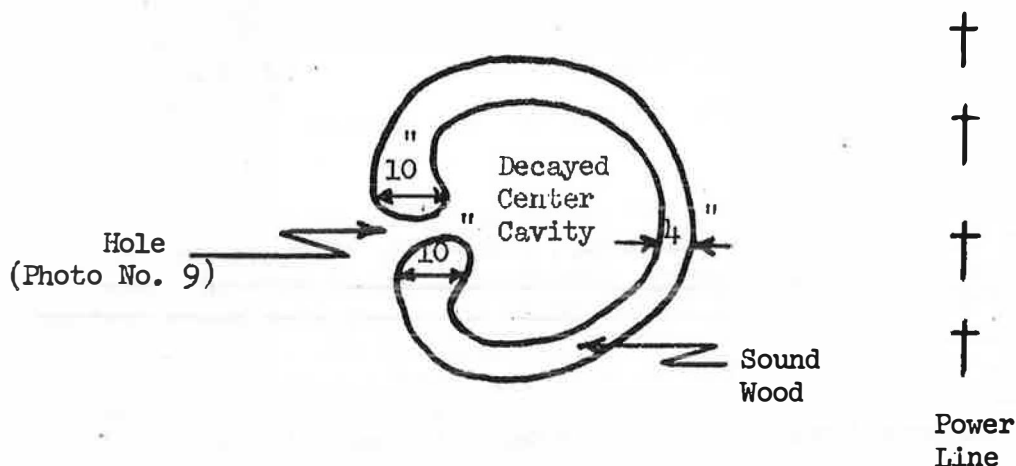
Defect

The defect was primarily a loss of mechanical strength in the two main boles of the tree. The heartwood (the major center and inside portion of a tree bole) was almost completely decayed and broken down by fungal activity prior to the fire. The large holes with the rounded edges formed by sapwood callus tissue would have revealed this condition prior to the fire (Photo Nos. 4 and 5, 7 through 11 and 13).

The loss of mechanical strength at the point where the large limb failed and fell on the power line wires is difficult to estimate but it would have been much in excess of 50 percent. The bole portion that remains nearest to the power line leans out directly towards the line at about a 30 degree angle. Any weight of limbs and foliage on this fork of the tree would have added to the leverage force applied to it. (Photo No. 2)

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The main bole in cross section at 3 feet above the ground looked about like this:



Detection of Defect

Numerous apparent defects are visible in the subject tree and other nearby trees. Seven other California Black Oak trees in the immediate vicinity were also examined. Most of these have large holes and dead limbs indicating defect.

There was a double hole connected by a wide (about 1 inch) crack at the main bole fork of the subject tree. This faced the power line at about a 45 degree angle. The holes were both about 10 inches long by 4 inches wide (Photo Nos. 11 and 12).

The smaller leaning bole nearest to the power line had a large (about 10 inches wide by 24 inches long) hole facing directly towards the line. It was about 60 inches from the ground to the bottom of this hole which should have made it easy to look directly into the hollow tree bole prior to the fire (Photo Nos. 12 and 13).

Two large limbs were laying on the ground under the power line and at about right angles to it. Both of these had been hung up in the two wires of the line that did not break and were taken down after the ground fire in the area around the tree had been extinguished.

The larger limb which was laying under a smaller limb was about 15 inches in diameter at the base. This appeared to be the remaining top of the small bole that had leaned out towards the power line. It was about 32 feet in length from the base and (point of failure) to the

outer tips of the main branches. The point of failure was about 6 to 8 feet above the ground. This limb contained some heart rot but it was fairly sound above the point of failure. A large side limb had broken off at the point of failure (Photo Nos. 5 and 8). This side limb which did not burn or char had a shell with about 2 inches of sound sapwood and 1 inch of decayed heartwood. This large limb also had a side limb further out which had a 3-foot long, and 5-inch diameter dead stub on it which was quite badly decayed. There were also a number of other smaller dead limbs and stubs on it, some of which had been cut or pruned several years ago (Photo Nos. 23 through 26).

Portions of branches from near the top of this limb had been cut out previously by Mr. Derr. These segments, which I examined in his station wagon, were quite green for the most part and only had evidence (small fungal sporophores) of a very minor amount of decay. They had several long, skinned marks on them where they had been in contact with the wire.

The other limb laying on top was about 9 inches in diameter at the point of failure. It had a 4-inch side limb about 24 inches from the point of failure which was dead from the tip back to within about 4 feet of the main limb. A 4-inch side limb had also been previously pruned off this main limb, which left a dead and somewhat decayed stub.

An examination of other portions of the bole which fell to the ground revealed that it had, for the most part, only a very thin shell of sound wood (Photo Nos. 14 through 19).

From a portion of the main bole which fell away from the power line it appeared that the main part of the tree had no real top. The outer sound shell thickness was only about 2 inches along most of this segment. There was a large hole at the top indicating that a portion had broken out of it sometime previously. There were also two large side holes back toward the base of this piece (Photo Nos. 4, 5 and 8).

Other

The identification of the fungi responsible for the decadent condition of the tree is not too important in this case. This requires the use of culturing and laboratory techniques. However, I took two samples which are currently being analysed. Fungal identification will be available in the near future if needed.

References

1. Forest Pathology, J. S. Boyce, 1961. McGraw-Hill.

4-Russell J. Mays, Attorney, Office of The General Counsel, 10/21/70

2. Silvical Characteristics of California Black Oak (Quercus kelloggii Newb.), Philip M. McDonald 1969, U. S. Forest Service Research Paper PSW-53.
3. Judging Hazard from Native Trees in California Recreational Areas, Willis W. Wagener, 1963. U. S. Forest Service Research Paper PSW-P1.

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Attachments